Health Update:

Infection Prevention and Control Recommendations for Ebola Virus Disease and Other Dangerous Diseases

February 19, 2019

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Health Update
February 19, 2019

FROM: **RANDALL W. WILLIAMS, MD, FACOG**
DIRECTOR

SUBJECT: **Infection Prevention and Control Recommendations for Ebola Virus Disease and Other Dangerous Diseases**

The Missouri Department of Health and Senior Services (DHSS) has been monitoring reports from the Centers of Disease Control and Prevention (CDC) and the World Health Organization (WHO) pertaining to the Ebola Virus Disease (EVD) outbreak declared on August 1, 2018, in the Democratic Republic of the Congo (DRC). As reported in WHO's *Disease Outbreak News* on February 7, 2019, the global risk level for the spread of Ebola from this outbreak remains low. However, the fact that the outbreak is ongoing serves as a reminder to Missouri healthcare providers to review infection prevention and control procedures as they relate to communicable infections, including EVD. CDC's Division of Healthcare Quality Promotion (DHQP) has shared the following information update with state healthcare-associated infection programs to help guide preparedness efforts.

Initial Triage of Patients

The following are steps that facilities should implement as a routine part of triage to quickly identify, isolate, and inform public health authorities about patients who may have potentially dangerous communicable infections:

- Ask about and document international travel histories at initial triage. This information can alert healthcare personnel to the possibility of communicable infections, such as viral hemorrhagic fevers or emerging respiratory viruses, and other health conditions, such as malaria, that need specific treatment.
- Identify patients who have fever and other signs and symptoms of infection and might warrant isolation pending further evaluation.
- With regard to reporting of communicable diseases, post information for contacting infection control personnel and the local public health agency in easily visible locations.

Current Infection Prevention and Control Recommendations for Ebola Virus Disease in U.S. Healthcare Facilities

CDC recommendations for infection prevention and control for patients with confirmed EVD or persons under investigation (PUIs) for EVD in U.S. healthcare facilities have been recently reviewed and are considered up to date. These recommendations are available at https://www.cdc.gov/vhf/ebola/clinicians/index.html.

Two important points:

- Separate personal protective equipment (PPE) guidance remains in place for the management of:
  a) Clinically stable PUIs
  https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/guidance-clinically-stable-puis.html
  b) Confirmed Ebola patients or clinically unstable PUIs
  https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/guidance.html

- A PPE Calculator Tool (https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/calculator.html) is available to assist healthcare facilities in determining the appropriate supply of PPE to have on hand to manage a PUI or patient with confirmed EVD.

The Regional Treatment Network for Ebola and Other Special Pathogens

Healthcare facilities and public health officials should be familiar with the U.S. Regional Treatment Network for Ebola and Other Special Pathogens (see link in the Additional Resources section, below). This includes facilities understanding their designated role as part of the network, continuing to be willing to serve in that capacity, and maintaining preparedness as a frontline facility, state-designated assessment hospital, state-designated treatment center, or HHS Assistant Secretary for Preparedness and Response (ASPR)-designated regional treatment center.

- Healthcare facilities and public health officials should have established plans for how PUIs or EVD patients are to be managed and referred.
- Officials with responsibility for infectious disease epidemiology and healthcare infection control should be in communication with their preparedness counterparts to ensure mutual understanding of the designations and preparedness status of assessment and treatment centers in their jurisdictions.
- The National Ebola Training and Education Center (NETEC) (see link in the Additional Resources section, below) is co-funded by ASPR and CDC. NETEC has additional online resources and a blog, and is available to provide on-site readiness assessments to hospitals for Ebola and other special pathogens.

Additional Resources

- The **"Missouri Ebola Virus Disease Response Plan"** revised in February 2019 is available in the EMResource document library. Please check with your organization's Emergency Preparedness staff or your regional healthcare coalition for access to EMResource.
- Main CDC EVD portal: https://www.cdc.gov/vhf/ebola/index.html.
- WHO Ebola situation reports: Democratic Republic of the Congo https://www.who.int/ebola/situation-reports/drc-2018/en/
- Regional Treatment Network for Ebola and Other Special Pathogens (ASPR) https://www.phe.gov/Preparedness/planning/hpp/reports/Documents/RETN-Ebola-Report-508.pdf
- National Ebola Training and Education Center (NETEC) https://netec.org/
- CDC Travel Health Notice for the current outbreak in the DRC (including special recommendations for healthcare personnel and organizations sponsoring healthcare personnel in the outbreak area) https://wwwnc.cdc.gov/travel/notices/alert/ebola-democratic-republic-of-the-congo
- The National Institutes of Health (NIH) has an open-label clinical trial, entitled "Pre-Exposure Prophylaxis in Individuals at Potential Occupational Risk for Ebola Virus Exposure" or "PREPARE," to vaccinate adult volunteers (including deploying healthcare personnel and other responders) against Ebola. Study sites are at NIH in Bethesda, MD, and Emory University in Atlanta, GA. https://clinicaltrials.gov/ct2/show/NCT02788227

DHSS will continue to monitor the ongoing EVD outbreak in the DRC and share any additional guidance provided by CDC and WHO. Questions should be directed to DHSS' Bureau of Communicable Disease Control and Prevention at 573-751-6113.

Health Update:

Widespread Outbreaks of Hepatitis A Among People Who Use Drugs and People Experiencing Homelessness across the United States

April 9, 2019

This document will be updated as new information becomes available. The current version can always be viewed at http://www.health.mo.gov.

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Health Update
April 9, 2019

FROM: **RANDALL W. WILLIAMS, MD, FACOG**
DIRECTOR

SUBJECT: **Update: Widespread Outbreaks of Hepatitis A Among People Who Use Drugs and People Experiencing Homelessness across the United States**

Distributed via the CDC Health Alert Network
March 25, 2019 1330 ET (1:30 PM ET)
CDCHAN-00418

Summary

***The Missouri Department of Health and Senior Services (DHSS), in collaboration with local public health agencies (LPHAs), has been responding to an outbreak of hepatitis A that was first identified in September 2017. From September 1, 2017 through April 1, 2019, 275 cases have been identified, primarily among individuals with reported illicit drug use or with positive drug screening test results. Among these cases, 134 (49%) have been hospitalized and one death has been reported. Current outbreak information is updated weekly at this website:
https://health.mo.gov/living/healthcondiseases/communicable/hepatitisa/index.php#outbreak.***

This CDC Health Alert Network (HAN) update (containing additional Missouri-specific information from DHSS, shown in red text) recommends that public health departments, healthcare facilities, and partners and programs providing services to affected populations vaccinate at-risk groups against hepatitis A, applying the updated recommendations of the Advisory Committee on Immunization Practices (ACIP).

This is an update to the CDC HAN advisory released on June 11, 2018, titled *Outbreak of Hepatitis A Virus (HAV) Infections among Persons Who Use Drugs and Persons Experiencing Homelessness* (https://emergency.cdc.gov/han/han00412.asp).

Questions should be directed to DHSS' Bureau of Communicable Disease Control and Prevention at 573-751-6113 or 800-392-0272 (24/7).

Background

Multiple states across the country have reported outbreaks of hepatitis A, primarily among people who use drugs and people experiencing homelessness. Since these outbreaks were first identified in 2016, more than 15,000 cases and 8,500 (57%) hospitalizations have been reported. Hospitalization rates have been higher than typically associated with HAV infection.[1, 2] Severe complications have also been reported, sometimes leading to liver transplantation or death; at least 140 deaths have occurred nationwide.

HAV is highly transmissible from person-to-person. States experiencing large-scale outbreaks have reported widespread transmission soon after their jurisdictions first recognized hepatitis A cases among populations being affected by these outbreaks. For many states, this has resulted in an unprecedented number of hepatitis A cases among unvaccinated adults since hepatitis A vaccine became available in 1996, and has led to prolonged community outbreaks that have been challenging and costly to control.

CDC recommends that public health departments, healthcare providers, and other partners serving affected populations launch a rapid and effective public health response with the following strategies.

Recommendations

Offer Vaccination to the Following Groups to Prevent or Control an Outbreak

The best way to prevent HAV infection is through vaccination with the hepatitis A vaccine. The following groups are at highest risk for acquiring HAV infection or developing serious complications from HAV infection in these outbreaks and should be offered the hepatitis A vaccine:

- **People who use drugs (injection or non-injection)**
- **People experiencing homelessness**
- **Men who have sex with men (MSM)**
- **People who are, or were recently, incarcerated**
- **People with chronic liver disease, including cirrhosis, hepatitis B, or hepatitis C**
- **People with close contact to any of the populations above**

One dose of single-antigen hepatitis A vaccine has been shown to control outbreaks of hepatitis A and provides up to 95% seroprotection in healthy individuals for up to 11 years.[3, 4]

Pre-vaccination serologic testing is not required to administer hepatitis A vaccine. Vaccinations should not be postponed if vaccination history cannot be obtained or records are unavailable.

New ACIP Recommendations since the June 2018 HAN00412

(https://emergency.cdc.gov/han/han00412.asp)

1. As of November 2, 2018, ACIP recommends hepatitis A vaccine for post-exposure prophylaxis (PEP) for people 12 months of age and older. Providers may also administer immunoglobulin to adults older than 40 years of age, if indicated, and persons who are immunocompromised or have chronic liver disease.[5]
2. As of February 15, 2019, ACIP recommends hepatitis A vaccination for people experiencing homelessness.[6]

Health Departments

Outreach

1. Identify venues serving populations at-risk for HAV infection, including county jails, syringe service programs, medication-assisted treatment (MAT) facilities, substance use disorder treatment facilities, homeless shelters, emergency departments, and sexually transmitted disease (STD) clinics. Where ongoing relationships with these facilities and service providers do not exist, engage with partners serving these populations to promote education and vaccination efforts.

- Health departments may contact the Bureau of Immunizations at 800-219-3224 regarding the availability of vaccine.

2. Employ novel approaches to improve vaccine delivery to hard-to-reach populations (e.g., Point of Dispensing sites (PODs), mobile outreach teams).
3. Include hepatitis A vaccination for ACIP-recommended risk groups in routine clinical services to increase vaccination coverage.
4. Engage multidisciplinary stakeholders (e.g., viral hepatitis or communicable disease experts, epidemiologists, immunization program staff, emergency preparedness staff, disease investigation specialists, health educators, behavioral scientists, harm reduction partners), which is critical for effective response efforts.

Case investigation, contact tracing, and outbreak response monitoring

1. Follow established procedures to interview cases and perform contact tracing for all new hepatitis A diagnoses.
2. Provide or encourage PEP of previously unvaccinated contacts as soon as possible, within 2 weeks after exposure.[5]
3. For further information, see the updated Hepatitis A chapter of the *Communicable Disease Investigation Reference Manual*: https://health.mo.gov/living/healthcondiseases/communicable/communicabledisease/cdmanual/pdf/HepA.pdf.

Healthcare Providers

1. Screen patients for risk factors (e.g., drug use, homelessness, incarceration, MSM, and chronic liver disease).
2. Recommend and administer hepatitis A vaccine to at-risk patients, regardless of the original presenting complaint or the type of clinical facility. In particular, the emergency department may be an individual's only interaction with the healthcare system and is an important opportunity for prevention.
   - A very limited supply of vaccine is available for LPHAs for those who are uninsured or underinsured.
   - Children under 19 who are Medicaid-eligible; do not have health insurance; are an American Indian or Alaskan Native; or are underinsured can visit a nearby Vaccines for Children provider https://health.mo.gov/living/wellness/immunizations/vfc-providers.php
3. Record immunizations in ShowMeVax, the state immunization information system (registry).
4. Consider hepatitis A as a diagnosis in anyone with jaundice or clinically compatible symptoms.
5. Rapidly report all persons diagnosed with hepatitis A to LPHAs or DHSS, per 19 CSR 20-20.020 (https://www.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c20-20.pdf) to ensure timely case investigation and follow-up of contacts.
6. Correctional facilities should reach out to LPHAs regarding the availability of vaccine.

For More Information

1. CSTE's 2019 Acute Hepatitis A Case Definition. https://wwwn.cdc.gov/nndss/conditions/hepatitis- a-acute/case-definition/2019/
2. MMWR. *Hepatitis A Virus Outbreaks Associated with Drug Use and Homelessness – California, Kentucky, Michigan, and Utah, 2017.* https://www.cdc.gov/mmwr/volumes/67/wr/mm6743a3.htm
3. CDC's Hepatitis A Outbreak website. https://www.cdc.gov/hepatitis/outbreaks/2017March-HepatitisA.htm
4. Outbreak specific considerations for hepatitis A vaccine administration.

https://www.cdc.gov/hepatitis/outbreaks/InterimOutbreakGuidance-HAV-VaccineAdmin.htm
5. CDC's Hepatitis A Virus website. https://www.cdc.gov/hepatitis/hav/index.htm
6. Viral Hepatitis Surveillance – United States, 2016. https://www.cdc.gov/hepatitis/statistics/2016surveillance/pdfs/2016HepSurveillanceRpt.pdf
7. Hepatitis A General Information Fact Sheet. https://www.cdc.gov/hepatitis/hav/pdfs/hepageneralfactsheet.pdf
8. CDC's The Pink Book. Chapter 9: Hepatitis A. https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/hepa.pdf

References

1. Ly K and Klevens RM. Trends in disease and complications of hepatitis A virus infection in the United States, 1999-2011: A new concern for adults. *J Infect Dis* 2015;212:176-182.
2. CDC. Viral hepatitis surveillance, United States, 2016. Atlanta, GA: CDC. https://www.cdc.gov/hepatitis/statistics/2016surveillance/pdfs/2016HepSurveillanceRpt.pdf
3. McMahon BJ, Beller M, Williams J, Schloss M, Tanttila H, Bulkow L. A program to control an outbreak of hepatitis A in Alaska by using an inactivated hepatitis A vaccine. *Arch Pediatr Adolesc Med* 1996;150(7):733-739.
4. Ott JJ, Wiersma ST. Single-dose administration of inactivated hepatitis A vaccination in the context of hepatitis A vaccine recommendations. *Int J Infect Dis* 2013;17(11):e939-944.
5. Nelson NP, Link-Gelles R, Hofmeister MG, et al. Update: Recommendations of the Advisory Committee on Immunization Practices for use of hepatitis A vaccine for post exposure prophylaxis and for preexposure prophylaxis for international travel. *MMWR Morb Mortal Wkly Rep* 2018;67(43):1216-1220. https://www.cdc.gov/mmwr/volumes/67/wr/mm6743a5.htm?s_cid=mm6743a5_w
6. Doshani M, Weng M, Moore K, Romero J, Nelson NP. Recommendations of the Advisory Committee on Immunization Practices for Use of Hepatitis A Vaccine for Persons Experiencing Homelessness. *MMWR Morb Mortal Wkly Rep* 2019;68:153-156. https://www.cdc.gov/mmwr/volumes/68/wr/mm6806a6.htm
7. National Notifiable Diseases Surveillance System. Hepatitis A, Acute 2019 Case Definition. https://wwwn.cdc.gov/nndss/conditions/hepatitis-a-acute/case-definition/2019/
8. Fiore AE, Wasley A, Bell BP; Advisory Committee on Immunization Practices (ACIP). Prevention of hepatitis A through active or passive immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 2006;55(No. RR-7). https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5507a1.htm

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HAN Info Service – Does not require immediate action; provides general public health information

##This message was distributed to state and local health officers, state and local epidemiologists, state and local laboratory directors, public information officers, epidemiologists, HAN coordinators, and clinician organizations##

Missouri Department of Health & Senior Services

Health Update:

Measles Prevention and Testing Recommendations for Areas Not Affected by Measles Outbreaks, Including Missouri

May 6, 2019

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Health Update
May 6, 2019

FROM: **RANDALL W. WILLIAMS, MD, FACOG**
DIRECTOR

SUBJECT: **Update: Measles Prevention and Testing Recommendations for Areas Not Affected by Measles Outbreaks, Including Missouri**

Background

From January 1 to April 26, 2019, 704 confirmed cases of measles have been reported in 22 states. This is the greatest number of cases reported in the U.S. since 1994 and since measles was declared eliminated in 2000. These cases occurred primarily among unvaccinated communities and are linked to travelers exposed to measles in countries with ongoing outbreaks, such as Israel, Ukraine, and the Philippines. Since January 1, 2019, one measles case has been reported in Missouri.

Given that ongoing measles transmission has not been identified in Missouri, the MMR vaccine schedule recommendations have not changed at this time. There is no recommendation from the Centers for Disease Control and Prevention (CDC) for vaccination campaigns among adults or individuals in non-affected areas to prevent measles outbreaks. One dose of measles, mumps, rubella (MMR) vaccine, or other presumptive immunity, is sufficient for most U.S. adults born on or after 1957.

Measles Epidemiology

Measles is one of the most contagious of all infectious diseases; approximately 9 out of 10 susceptible persons with close contact to a measles patient will develop measles. The virus is transmitted by direct contact with infectious droplets or by airborne spread when an infected person breathes, coughs, or sneezes. Measles virus can remain infectious in the air for up to two hours after an infected person leaves an area. Patients are considered to be contagious from 4 days before until 4 days after the rash appears.

Healthcare providers should maintain a high index of suspicion for measles among febrile patients with a rash consistent with measles. A typical measles rash appears on the forehead or the back of the head, then spreads downward to the trunk and extremities over the next three days. Patients of all ages with clinical signs/symptoms compatible with measles (febrile rash plus cough, coryza, and/or conjunctivitis) should be asked about recent travel and contact with returning travelers, or contact with someone with a febrile rash illness. It is also important to verify the patient's vaccination status. Individuals who have been previously exposed to measles antigen may have a modified disease presentation. All persons exposed to measles regardless of vaccination status should monitor for symptoms of measles for the 21 days after the last exposure.

Measles Prevention

Persons who have been exposed to measles should contact their health care provider if they develop cold-like symptoms with a fever and/or rash consistent with measles. They should NOT go to any health care facility without calling first. Health care facilities referring a patient should also contact the receiving facility in advance of the patient's arrival to avoid additional exposures. The suspect case should be kept separated from others to prevent further spread. Isolate suspect measles case-patients and immediately report suspected cases to the local public health agency, or to DHSS at 573-751-6113 or 800-392-0272 (24/7). To ensure prompt public health response, do not wait for laboratory confirmation.

The best way to stop the spread of measles is to be vaccinated. Two doses of MMR vaccine provides 97% protection against the disease. One dose provides 93% protection.

The current general recommendations for MMR vaccination in areas not affected by measles outbreaks are:

- Children should have their first dose of MMR between 12 and 15 months of age and their second dose between 4 and 6 years of age.
- Adults who do not have evidence of immunity (written documentation, laboratory evidence of immunity such as titers, laboratory confirmed measles infection, or birth after 1957) should receive at least one dose of MMR vaccine.
- Individuals who are considered high risk, such as healthcare workers and students attending colleges or vocational schools, should receive two doses of MMR vaccine separated by at least 28 days.
- International travelers should receive the following MMR vaccinations:
    - Infants 6-11 months of age should receive one dose of MMR vaccine.
    - Children 12 months and older should receive two doses of MMR vaccine separated by 28 days.
    - Adults with documentation of one dose of MMR vaccine should receive a second dose.
    - Adults with no documentation should receive two doses of MMR vaccine separated by 28 days.

For more detailed recommendations and contraindications for MMR vaccination, please see the **References** section.

Measles Testing

The Missouri State Public Health Laboratory (MSPHL) provides laboratory support for the diagnosis of measles infections occurring in Missouri. The MSPHL will only test specimens that are approved by state public health officials. For questions regarding storage and shipping of all samples, please contact the MSPHL Virology Unit at 573-751-3334.

Healthcare providers should obtain **both** a serum sample for IgM serology **and** a throat swab, nasopharyngeal swab, or urine sample for RT-PCR molecular detection. Molecular samples should be collected along with serum from patients suspected of having measles at first contact with them. See instructions for collection in the **References** section.

Detection of measles RNA and measles virus isolation are most successful when samples are collected on the first day of rash through the 3 days following onset of rash. Some patient samples may have detectable virus up to 10 days post-rash onset. A negative RT-PCR result does not rule out measles because the test can be affected by the timing of specimen collection and the quality and handling of the clinical specimens.

If the acute-phase serum sample is collected ≤ 3 days after rash onset and is negative, and the case has a negative (or not done) result for RT-PCR, a second serum sample collected 3-10 days after symptom onset is recommended because in some cases the IgM response is not detectable until 3 days after symptom onset.

Questions should be directed to DHSS' Bureau of Communicable Disease Control and Prevention at 573-751-6113 or 800-392-0272 (24/7).

References

Measles cases reported in the US:
https://www.cdc.gov/measles/cases-outbreaks.html

CDC webpage for healthcare professionals:
https://www.cdc.gov/measles/hcp/index.html

Measles Outbreak Toolkit for Healthcare Providers:
https://www.cdc.gov/measles/toolkit/healthcare-providers.html

Measles Vaccination: Information for Healthcare Professionals:
https://www.cdc.gov/vaccines/vpd/mmr/hcp/index.html

Frequently Asked Questions about Measles in the U.S.:
https://www.cdc.gov/measles/about/faqs.html

MSPHL Measles serology instructions:
http://health.mo.gov/lab/measlesrubella.php

CDC measles RT-PCR instructions (do NOT ship specimens directly to CDC):
https://www.cdc.gov/measles/lab-tools/rt-pcr.html

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Health Update:

Severe Lung Disease Associated with Vaping

September 12, 2019

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Health Update
September 12, 2019

FROM: **RANDALL W. WILLIAMS, MD, FACOG**
DIRECTOR

SUBJECT: **Severe Lung Disease Associated with Using E-Cigarette Products**

*****Missouri healthcare providers with questions should contact the Tobacco Prevention and Control Program at 573-522-2824, or 800-392-0272 (24/7)*****

Summary
The Missouri Department of Health and Senior Services (DHSS) is providing: 1) background information on the forms of e-cigarette products, 2) information on the multistate outbreak of severe pulmonary disease associated with using e-cigarette products (devices, liquids, refill pods, and cartridges), and 3) clinical features of patients with severe pulmonary disease. This Health Update also provides recommendations for clinicians and the public based on currently available information.

General Background
The Centers for Disease Control and Prevention (CDC), the U.S. Food and Drug Administration (FDA), state and local health departments, and other clinical and public health partners are investigating a multistate outbreak of severe pulmonary disease associated with e-cigarette product (devices, liquids, refill pods, and/or cartridges) use. This investigation is ongoing and has not identified a cause, but all reported cases have a history of using e-cigarette products.

E-cigarettes are devices that deliver an aerosol to the user by heating a liquid that usually contains nicotine, flavorings, and other chemicals. E-cigarettes can also be used to deliver marijuana or other substances.

E-cigarettes can contain harmful or potentially harmful ingredients, including nicotine, heavy metals (e.g., lead), volatile organic compounds, and cancer-causing chemicals. Additionally, some e-cigarette products are used to deliver illicit substances; may be acquired from unknown or unauthorized (i.e., "street") sources; and may be modified for uses that could increase their potential for harm to the user.

Youth, young adults, pregnant women, as well as adults who do not currently use tobacco products should not use e-cigarettes. E-cigarettes containing nicotine have the potential to help some individual adult smokers reduce their use of and transition away from cigarettes. However, e-cigarettes are not currently approved by FDA as a quit smoking aid, and the available science is inconclusive on whether e-cigarettes are effective for quitting smoking.

Outbreak Background

As of September 6, 2019, 450 possible cases of lung illness associated with the use of e-cigarette products have been reported from 33 states and the U.S. Virgin Islands, and additional reports of pulmonary illness are under investigation. To date, six individuals (from Illinois, Wisconsin, Oregon, Indiana, Minnesota, and Kansas) have died from severe pulmonary disease. Nine cases have been reported in Missouri, two have been confirmed and seven are under investigation. One of the Missouri cases had a positive finding for lipid-laden macrophages from a bronchoalveolar lavage (BAL) specimen.

No evidence of infectious diseases has been identified; therefore, lung illnesses are likely associated with a chemical exposure. Initial published reports from the investigation point to clinical similarities among cases. Patients report e-cigarette use and similar symptoms and clinical findings including:

- cough, shortness of breath, or chest pain
- nausea, vomiting, or diarrhea
- fatigue, fever, or weight loss
- elevated heart rate

Some patients have reported that their symptoms developed over a few days, while others have reported that their symptoms developed over several weeks. A pulmonary infection does not appear to be causing the symptoms, which have generally not improved with antibiotic treatment alone.

The investigation has not identified any specific substance or e-cigarette product that is linked to all cases. Many patients report using e-cigarette products with liquids that contain cannabinoid products, such as tetrahydrocannabinol (THC).

Radiologic findings have varied and are not present in all patients upon initial presentation. Bilateral pulmonary infiltrates and diffuse ground-glass opacities have been reported. Many patients required supplemental oxygen, some required assisted ventilation and oxygenation, and some were intubated. Some patients have been treated with corticosteroids with demonstrated improvement. Antibiotic therapy alone has not consistently been associated with clinical improvement. Assessment for infectious etiologies has been completed in many patients without an identified infectious cause. Several patients have been diagnosed with lipoid pneumonia based on clinical presentation and detection of lipids within bronchoalveolar lavage samples stained specifically to detect oil.

Recommendations for Clinicians

1. Missouri providers should report cases of severe pulmonary disease of unclear etiology and a history of e-cigarette product use within the past 90 days to DHSS or their local public health agency (LPHA). Reporting of cases will ensure prompt follow-up and help determine the cause of these pulmonary illnesses.
    a. These cases are currently being classified as "vaping-associated pulmonary illness," or VAPI. **Missouri considers instances of VAPI to be immediately reportable under 19 19 CSR 20-20.020 1(c).** (https://www.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c20-20.pdf) **Immediately reportable diseases should be reported immediately upon knowledge or suspicion by telephone, FAX, or other rapid communication to the LPHA, or to DHSS at 800-392-0272.**
    b. Information on VAPI cases should be provided using a Missouri Disease Case Report, form MO 580-0779. (https://health.mo.gov/living/healthcondiseases/communicable/communicabledisease/cdmanual/pdf/CD-1.pdf)

2. Ask all patients who report e-cigarette product use within the last 90 days about signs and symptoms of pulmonary illness.
3. If e-cigarette product use is suspected as a possible etiology of a patient's severe pulmonary disease, obtain detailed history regarding:
    - Substance(s) used: nicotine, cannabinoids (e.g., marijuana, THC, THC concentrates, CBD, CBD oil, synthetic cannabinoids [e.g., K2 or spice], hash oil, Dank vapes), flavors, or other substances
    - Substance source(s): commercially available liquids (i.e., bottles, cartridges, or pods), homemade liquids, and re-use of old cartridges or pods with homemade or commercially bought liquids
    - Device(s) used: manufacturer; brand name; product name; model; serial number of the product, device, or e-liquid; if the device can be customized by the user; and any product modifications by the user (e.g., exposure of the atomizer or heating coil)
    - Where the product(s) were purchased
    - Method of substance use: aerosolization, dabbing, or dripping
    - Other potential cases: sharing e-cigarette products (devices, liquids, refill pods, or cartridges) with others
4. Determine if any remaining product, including devices and liquids, are available for testing. Testing can be coordinated with DHSS or your LPHA.
5. Consider all possible causes of illness in patients reporting respiratory and gastrointestinal symptoms and of e-cigarette product use. Evaluate and treat for other possible causes of illness (e.g., infectious, rheumatologic, neoplastic) as clinically indicated. Consider consultation with specialists (pulmonary, infectious disease, critical care, medical toxicology) as appropriate.
6. Clinical improvement of patients with severe pulmonary disease associated with e-cigarette use has been reported with the use of corticosteroids. The decision to use corticosteroids should be made on a case-by-case basis based on risks and benefits and the likelihood of other etiologies.
7. Lung biopsies have been performed on some patients. If a lung biopsy is obtained, lipid staining may be considered during pathologic examination, and is best performed on fresh tissue. Routine pathology tissue processing (including formalin-fixation and paraffin-embedding) can remove lipids. Conducting routine tissue processing and histopathologic evaluation is still important. Consider consultation with specialists in pulmonary medicine and pathology to help inform any evaluation plan.
8. Patients who have received treatment for severe pulmonary disease related to e-cigarette product use should undergo follow-up evaluation as clinically indicated to monitor pulmonary function.

Recommendations for Medical Examiner, Coroner's Office or Other Pathologists

1. Report possible cases, especially those without an alternative, likely diagnosis explaining lung injury, to DHSS' Tobacco Prevention and Control Program at 573-522-2824. If individuals are identified after death or at autopsy who showed signs of severe pulmonary disease as described above, medical examiners and coroners are encouraged to report the cases to their LPHA or DHSS. Thorough sampling of trachea, bronchi, and lung parenchyma with collection of fresh lung tissue for staining of lipids (e.g., oil red O) and submission of formalin-fixed, paraffin-embedded tissues for routine histopathology are recommended.

Recommendations for the Public

1. While this investigation is ongoing, consider refraining from using e-cigarette products.
2. If you do use e-cigarette products and you experience symptoms like those reported in this outbreak, seek medical care promptly. DHSS will continue to alert the public throughout this investigation.
3. Regardless of the ongoing investigation:
    - Youth and young adults should not use e-cigarette products.
    - Women who are pregnant should not use e-cigarette products.
4. Adults who do not currently use tobacco products should not start using e-cigarette products.
5. If you do use e-cigarette products, you should not buy these products off the street (for example, e-cigarette products with THC or other cannabinoids).
6. You should not modify e-cigarette products or add any substances to these products that are not intended by the manufacturer.
7. Adult smokers who are attempting to quit should use evidence-based treatments, including counseling and FDA-approved medications. If you need help quitting tobacco products, including e-cigarettes, contact your doctor or other medical provider, or call the Missouri Tobacco Quitline at 1-800-QUIT-NOW (1-800-784-8669).
8. For information on the text-based e-cigarette quit program from Truth Initiative, visit truthinitiative.org/quitecigarettes or text "DITCHJUUL" to 88709.
9. If you are concerned about your health after using an e-cigarette product, you can also call the Missouri Poison Center at 1-800-222-1222.
10. We encourage the public to submit detailed reports of any unexpected health or product issues related to tobacco or e-cigarette products to the FDA via the online Safety Reporting Portal: https://www.safetyreporting.hhs.gov.

For More Information

- Call the DHSS' Tobacco Prevention and Control Program at 573-522-2824.
- For assistance with managing patients suspected of illness related to recreational, illicit, or other drugs, call the Missouri Poison Center at: 1-800-222-1222.
- Information on electronic cigarettes and similar devices: https://www.cdc.gov/e-cigarettes

References

Barrington-Trimis JL, Samet JM, McConnell R**.** Flavorings in electronic cigarettes: an unrecognized respiratory health hazard? *JAMA*. 2014;312(23):2493-4. https://jamanetwork.com/journals/jama/fullarticle/1935097

Behar RZ, Davis B, Wang Y, Bahl V, Lin S, Talbot P**.** Identification of toxicants in cinnamon-flavored electronic cigarette refill fluids. *Toxicol In Vitro*. 2014;28(2):198-208. https://www.ncbi.nlm.nih.gov/pubmed/24516877

Flower M, Nandakumar L, Singh M, Wyld D, Windsor M, Fielding D**.** Respiratory bronchiolitis-associated interstitial lung disease secondary to electronic nicotine delivery system use confirmed with open lung biopsy. *Respirol Case Rep*. 2017;5(3):e00230. https://onlinelibrary.wiley.com/doi/full/10.1002/rcr2.230

Gerloff J, Sundar IK, Freter R, Sekera ER, Friedman AE, Robinson R, et al. Inflammatory Response

and Barrier Dysfunction by Different e-Cigarette Flavoring Chemicals Identified by Gas Chromatography-Mass Spectrometry in e-Liquids and e-Vapors on Human Lung Epithelial Cells and Fibroblasts. *Appl In Vitro Toxicol*. 2017;3(1):28-40. https://www.liebertpub.com/doi/10.1089/aivt.2016.0030

He T, Oks M, Esposito M, Steinberg H, Makaryus M**.** "Tree-in-Bloom": Severe Acute Lung Injury Induced by Vaping Cannabis Oil. *Ann Am Thorac Soc*. 2017;14(3):468-70. https://www.atsjournals.org/doi/10.1513/AnnalsATS.201612-974LE

Khan MS, Khateeb F, Akhtar J, Khan Z, Lal A, Kholodovych V, et al. Organizing pneumonia related to electronic cigarette use: A case report and review of literature. *Clin Respir J*. 2018;12(3):1295-9. https://onlinelibrary.wiley.com/doi/abs/10.1111/crj.12775

Kosmider L, Sobczak A, Prokopowicz A, Kurek J, Zaciera M, Knysak J, et al. Cherry-flavoured electronic cigarettes expose users to the inhalation irritant, benzaldehyde. *Thorax*. 2016;71(4):376-7. https://thorax.bmj.com/content/71/4/376

Layden, Jennifer E., M.D., Ph.D.; Ghinai, Isaac, M.B., B.S.; Pray, Ian, Ph.D.; Kimball, Anne, M.D.; et al. Pulmonary Illness Related to E-Cigarette Use in Illinois and Wisconsin — Preliminary Report. 2019. *N Engl J Med*. 2019 Sep 6 [Epub ahead of print]. https://www.nejm.org/doi/full/10.1056/NEJMoa1911614

Health Update:

Update 2: Lung Injuries Associated with E-cigarette, or Vaping, Product Use

November 14, 2019

This document will be updated as new information becomes available. The current version can always be viewed at http://www.health.mo.gov.

The Missouri Department of Health & Senior Services (DHSS) is now using four types of documents to provide important information to medical and public health professionals, and to other interested persons:

Health Alerts convey information of the highest level of importance which warrants immediate action or attention from Missouri health providers, emergency responders, public health agencies, and/or the public.

Health Advisories provide important information for a specific incident or situation, including that impacting neighboring states; may not require immediate action.

Health Guidances contain comprehensive information pertaining to a particular disease or condition, and include recommendations, guidelines, etc. endorsed by DHSS.

Health Updates provide new or updated information on an incident or situation; can also provide information to update a previously sent Health Alert, Health Advisory, or Health Guidance; unlikely to require immediate action.

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Health Update
November 14, 2019

FROM: **RANDALL W. WILLIAMS, MD, FACOG**
DIRECTOR

SUBJECT: **Update 2: Lung Injuries Associated with E-cigarette, or Vaping, Product Use**

*****Missouri healthcare providers with questions should contact the Tobacco Prevention and Control Program at 573-522-2824, or 800-392-0272 (24/7)*****

Summary and Action Items

This Health Update provides updated information regarding the ongoing investigation of e-cigarette, or vaping, product use associated lung injury (EVALI), as well as new guidance and resources for reporting and investigating cases. The Centers for Disease Control and Prevention's (CDC's) October 19, 2019, *Morbidity and Mortality Weekly Report* (MMWR) on clinical guidance is also summarized and referenced.

The Missouri Department of Health and Senior Services (DHSS) Recommends:

1. All patients with serious respiratory illness of unknown etiology be asked about recent use of electronic cigarettes and vaping,
2. Ruling out infectious and non-infectious etiologies in patients with unexplained serious respiratory illness and vaping exposures,
3. A urinary toxicology screen (including tetrahydrocannabinol [THC], quantified as necessary) be obtained for these patients if a reliable vaping history is unavailable, or if otherwise clinically indicated,
4. Specialty case consultation be considered in severe cases of vaping-associated lung injury,
5. Systemic steroid use in clinical management, although data on its effectiveness are limited. When possible, decisions on the use of corticosteroids should be made in consultation with a pulmonologist,
6. Advising all patients with vaping-associated lung injury to stop vaping and offering evidence-based cessation support, and
7. Follow-up with all patients with vaping-associated lung injury within 1-2 weeks of hospital discharge.

DHSS Asks:

1. That patients with unexplained serious respiratory illness and recent vaping be reported to DHSS using the attached new case report form (also available as a fillable form at https://health.mo.gov/living/wellness/tobacco/lung-injury-outbreak/doc/fillable-form.docx).
2. That providers ask and encourage patients with vaping-associated lung injury to complete the attached patient survey,

3. That clinical samples from bronchoalveolar lavage (BAL) and/or tissue biopsies be saved. Work with DHSS' Tobacco Prevention and Control Program to facilitate shipment of these specimens to the Missouri State Public Health Laboratory (MSPHL) for routing to CDC, and
4. That remaining vaping product or devices from case-patients be retained for testing. Work with the Tobacco Prevention and Control Program to facilitate shipment of these specimens to MSPHL.

Background

As of November 5, 2019, 2,051 cases of e-cigarette, or vaping, product use associated lung injury (EVALI) have been reported to CDC from 49 states (all except Alaska), the District of Columbia, and 1 U.S. territory. Thirty-nine deaths have been confirmed in 24 states, including two from Missouri. As of November 13, 2019, DHSS has received 56 reports of suspected cases, with 35 of these cases meeting the case definition for confirmed or probable.

Patients are considered cases if they have acute lung injury without an identified etiology and have a history of using electronic cigarette or vaping products in the past 3 months. The age among the 35 Missouri cases ranges from 16 to 55 years, with a median age of 22 years; 76% are male. The vast majority have been hospitalized, and some have required intensive care management.

Potential Exposures

All Missouri patients reported vaping in the weeks to months prior to illness. The majority of patients report using vaping products containing THC or cannabidiol (CBD) oil, particularly in pre-filled cartridges that were acquired from informal sources (e.g. dealer, off the street, friends, and family). Many patients report using nicotine-containing vaping products, and a large number of patients used both.

Recent CDC laboratory testing of bronchoalveolar lavage (BAL) fluid samples (or samples of fluid collected from the lungs) from 29 patients with EVALI submitted to CDC from 10 states found vitamin E acetate in **all** of the BAL fluid samples. Vitamin E acetate is used as an additive in the production of e-cigarette, or vaping, products.

DHSS recommends asking all patients with respiratory illness about recent electronic cigarette use or vaping practices, including whether or not they use products containing nicotine, THC, and/or CBD oils.

Symptoms

Patients may have some or all of the following:

- Respiratory symptoms – cough, shortness of breath, pleuritic chest pain.
- Gastrointestinal symptoms – nausea, vomiting, diarrhea, abdominal pain.
- Constitutional symptoms – fever, chills, night sweats, weight loss, fatigue.

Patient symptoms worsened over a period of days or weeks before admission. The majority sought clinical care in the days prior to their admission, and many received outpatient antibiotics which did not improve their symptoms.

Diagnostic Studies

Chest radiographs showed bilateral opacities, typically in the lower lobes, and CT imaging of the chest showed diffuse ground glass opacities, often with subpleural sparing.

When performed, urinary toxicology screens for THC have usually been positive and – when quantified – very high levels of THC have been observed.

DHSS recommends a urinary toxicology screen for patients with respiratory illness of unknown etiology when a reliable vaping history is unavailable.

Many patients present with raised inflammatory markers, such as neutrophilia, high CRP, and ESR. The evaluations for infectious etiologies in those patients have been predominantly negative.

DHSS recommends work-up for infectious etiologies in patients with unexplained respiratory illness and vaping exposures.

A respiratory viral panel, influenza testing, blood and sputum cultures, *Legionella*, *Mycoplasma*, and *S. pneumoniae* testing may be indicated. Other clinically-warranted infectious (e.g. histoplasmosis, blastomycosis, *Pneumocystis carinii*) and non-infectious etiologies (e.g. rheumatologic or neoplastic causes) may also need to be ruled out.

The decision to perform a BAL and/or lung biopsy should be based on individual clinical circumstances. BAL and pathology specimens have often revealed lipid-laden macrophages.

Please refer to the *International Classification of Diseases, Tenth Edition, Clinical Modification (ICD-10-CM) Supplement: Coding encounters related to E-cigarette, or Vaping, Product Use.* (October 17, 2019) (https://www.cdc.gov/nchs/data/icd/Vapingcodingguidance2019_10_17_2019.pdf) for official diagnosis coding guidance for healthcare encounters and deaths related to EVALI.

Management

Aggressive supportive care is warranted. Systemic steroids may be helpful in clinical management, although data are limited. A clinical improvement with high dose IV steroids has been observed in some cases, however whether steroids caused this improvement is not yet known with certainty. When possible, decisions on the use of corticosteroids should be made in consultation with a pulmonologist. All patients with vaping-associated lung injury should be advised to stop the use of electronic cigarette or vaping products, and evidence-based cessation support should be offered.

CDC recommends a follow-up visit for patients within 1-2 weeks of discharge, including pulse oximetry and consideration of a repeat chest radiograph. Further follow-up (including pulmonary function tests) may also be required.

Prevention

At this time, it is not known with certainty what product(s), chemicals, or devices are linked to these illnesses.

DHSS recommends not using e-cigarette or vaping products, particularly those containing THC.

Clinical Specimens Testing

CDC is conducting testing on BAL fluid and biopsy specimens submitted to public health agencies. The test results are designed for the public health investigation and will not be returned on an individual patient basis to the clinical team.

DHSS is requesting that clinicians and facilities submit the following samples from probable/confirmed cases:

1. Remaining BAL fluid (if BAL is obtained for clinical purposes), supernatant, and/or cell pellet.
2. Formalin-fixed (wet) tissue or formalin-fixed, paraffin-embedded (FFPE) tissue blocks, if lung tissue biopsies are performed for clinical purposes.

Please refer to the following guides from CDC for detailed instructions on sample collection and processing:

Laboratory Clinical Sample Collection, Storage, and Submission Guidance for Lung Injury Associated with E-Cigarette, or Vaping Product use
https://www.cdc.gov/tobacco/basic_information/e-cigarettes/pdfs/Lab-Clinical-Specimen-Collection-Storage-Guidance-Lung-Injury-508.pdf

Specimen Submission Guidance for Pathologic Evaluation of Tissues Specimens from Cases of Lung Injury Associated with E-Cigarette, or Vaping Product
https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease/healthcare-providers/pdfs/specimen-submission-req.pdf

Shipments of these specimens will be accepted by CDC only if they are forwarded from MSPHL. MSPHL will assist health care providers on how to submit specimens to the laboratory and then on to CDC. Before any specimen is sent to MSPHL, the DHSS Tobacco Prevention and Control Program must first be consulted for approval of submission. Health care providers can contact the Tobacco Prevention and Control Program at 573-522-2824 or 800-392-0272 (24/7).

Aerosol Emissions from E-cigarette, or Vaping, Products are being tested by CDC:
CDC is offering aerosol emissions testing of case-associated product samples from e-cigarette, or vaping, products and e-liquids. Analysis of aerosol emissions will augment FDA's ongoing work to characterize e-liquids and will improve the understanding of exposure among case-patients associated with the lung injury outbreak. CDC is coordinating e-cigarette, or vaping, product analysis with FDA.

If product, including devices and liquids, are available for testing, healthcare providers should contact the Tobacco Prevention and Control Program at 573-522-2824 or 800-392-0272 (24/7) to coordinate sample submission. Only full to half full cartridges will be accepted.

In addition to the testing guidance above, DHSS is asking clinicians to:

1. Report patients with unexplained serious respiratory illness and recent electronic cigarette, or vaping, product use to the Tobacco Prevention and Control Program by faxing the attached new case report form (also available as a fillable form at https://health.mo.gov/living/wellness/tobacco/lung-injury-outbreak/doc/fillable-form.docx) to 573-522-2856. Missouri considers suspected cases of EVALI to be immediately reportable under 19 CSR 20-20.020 1(c). (https://www.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c20-20.pdf)

    a. If additional information to determine the status of the case is needed, the person identified as the reporter on the case form will receive an e-mail from box.com, on behalf of Valerie Howard, inviting you to submit case records to a secure folder in box.com.

2. Ask and encourage patients with unexplained serious respiratory illness and recent electronic cigarette, or vaping, product use to complete the attached patient survey (also available at https://health.mo.gov/living/wellness/tobacco/lung-injury-outbreak/pdf/lung-injury-patient-survey.pdf).

Both of these forms, along with other relevant information, are available on the Healthcare Provider tab of the DHSS Vaping Associated Lung Injury webpage (https://health.mo.gov/living/wellness/tobacco/lung-injury-outbreak/index.php).

Contact

Please contact Valerie Howard (Valerie.howard@health.mo.gov) with the DHSS Tobacco Prevention and Control Program at 573-522-2824 with any questions.

Resources

- Update: Interim Guidance for Health Care Providers Evaluating and Caring for Patients with Suspected E-cigarette, or Vaping, Product Use Associated Lung Injury — United States, October 2019. *MMWR* 2019;68(41):919-27. https://www.cdc.gov/mmwr/volumes/68/wr/pdfs/mm6841e3-H.pdf
- *International Classification of Diseases, Tenth Edition, Clinical Modification (ICD-10-CM) Supplement: Coding encounters related to E-cigarette, or Vaping, Product Use.* (October 17, 2019) https://www.cdc.gov/nchs/data/icd/Vapingcodingguidance2019_10_17_2019.pdf
- Clinician Outreach and Communication Activity (COCA) Webinar – Update: Interim Guidance for Healthcare Providers Evaluating and Caring for Patients with Suspected E-cigarette or Vaping Product Use Associated Lung Injury Presentation. https://emergency.cdc.gov/coca/ppt/2019/COCA_Call_Update_Lung_Injury_10.17.19_Final_comp.pdf
- COCA Webinar – Outbreak of Lung Injury Associated with E-cigarette Product Use or Vaping: Information for Clinicians Presentation. https://emergency.cdc.gov/coca/ppt/2019/COCA_Call_Outbreak_of_lung_injury_ecigarettes_09.19.19_Final.pdf
- Poster for Clinical Settings in English and Spanish

  https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease/healthcare-providers/pdfs/poster-for-clinical-settings.pdf (English)

  https://www.cdc.gov/tobacco/basic_information/e-cigarettes/spanish/enfermedad-pulmonar-grave/pdf/para-su-uso-en-entornos-de-atencion-medica.pdf (Spanish)

For more information

- For assistance with managing patients suspected of illness related to recreational, illicit, or other drugs, call the Missouri Poison Center at: 800-222-1222.
- Information on electronic cigarettes and similar devices: https://www.cdc.gov/e-cigarettes
- For more information on the EVALI outbreak: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html

Reference

- Update: Interim Guidance for Health Care Providers Evaluating and Caring for Patients with Suspected E-cigarette, or Vaping, Product Use Associated Lung Injury — United States, October 2019. *MMWR* 2019;68(41):919-27. https://www.cdc.gov/mmwr/volumes/68/wr/pdfs/mm6841e3-H.pdf

E-Cigarette or Vaping Product Use Associated Lung Injury (EVALI)
Missouri Case Report Form (CRF)

The Department of Health and Senior Services and local health departments are investigating cases of unexplained lung injury associated with electronic cigarette or vaping product use. Please see the DHSS website for more details about this investigation (https://health.mo.gov/living/wellness/tobacco/lung-injury-outbreak/index.php). Please complete this form for any suspected case patient, encourage the patient to self-complete the ***Patient Survey*** (located on DHSS website: https://health.mo.gov/living/wellness/tobacco/lung-injury-outbreak/pdf/lung-injury-patient-survey.pdf), and **send these to DHSS at *valerie.howard@health.mo.gov* (fax 573-522-2856)**.

Date Form Completed: _____ Name of Hospital: _____
Clinician Name: _____ Clinician Phone Number: _____
Reporter Name: _____ Reporter E-Mail: _____

Patient Demographics

Full Name: _____ Gender ☐ M ☐ F Date of Birth: _____
Phone Number: _____ Race ☐ White ☐ Black ☐ Other Ethnicity ☐ Hispanic ☐ Non-Hispanic
Mailing Address: _____ Zip: _____

Patient Inhalational Use in the Past 90 Days (please ask patient, or proxy if patient unable to answer)

Any combustible *tobacco* use? (i.e. cigarettes, cigars etc.) ☐ Yes ☐ No
Any combustible *marijuana* use? (i.e. any non e-cigarette marijuana) ☐ Yes ☐ No
Any **nicotine** e-cigarette (vaping) use reported? ☐ Yes ☐ No Date last used: _____
If yes, list brands: _____ Frequency: _____ times per day
Any **THC** e-cigarette (vaping) use reported? ☐ Yes ☐ N Date last used: _____
If yes, list brands: _____ Frequency: _____ times per day

Please give the patient a copy of the attached Patient Survey and ask a staff member to assist them if needed.

Patient Symptoms

Chief complaint: _____ Date first symptom started: _____
GI symptoms? ☐ Yes ☐ No If yes, describe: _____
Respiratory symptoms? ☐ Yes ☐ No If yes, describe: _____
Constitutional symptoms? ☐ Yes ☐ No If yes, describe: _____
Weight loss? ☐ Yes ☐ No If yes, amount (lb): _____

Past medical history

Chronic respiratory disease (asthma, COPD etc)? ☐ Yes ☐ No Specify: _____
Depression/anxiety? ☐ Yes ☐ No Specify: _____

Imaging: ***Please attach copy of the radiologist's report for any chest imaging.***

Chest imaging performed	☐ CT chest	☐ Chest X-ray	☐ Both	
Location of abnormal findings	☐ Bilateral	☐ Right	☐ Left	☐ Normal (no findings)
Infiltrates/opacities present	☐ Yes	☐ No		
Subpleural sparing on CT	☐ Yes	☐ No	☐ Unknown	

Infectious Disease Testing

Respiratory viral panel*	☐ Positive	☐ Negative	☐ Pending	☐ Not Done
Influenza	☐ Positive	☐ Negative	☐ Pending	☐ Not Done
Legionella	☐ Positive	☐ Negative	☐ Pending	☐ Not Done
Blood cultures*	☐ Positive	☐ Negative	☐ Pending	☐ Not Done
Strep pneumoniae	☐ Positive	☐ Negative	☐ Pending	☐ Not Done
Mycoplasma pneumoniae	☐ Positive	☐ Negative	☐ Pending	☐ Not Done

*Organism found: _____

Clinical Course

Admitted?	☐ Yes	☐ No	Date admitted/attended: _____
Prior outpatient attendance?	☐ Yes	☐ No	Date of OP attendance: _____
Admitted to ICU (at time of reporting)?	☐ Yes	☐ No	Date admitted to ICU: _____
SIRS criteria met?	☐ Yes	☐ No	
Treated with steroids?	☐ Yes	☐ No	Date of started if known: _____
Required respiratory support?	☐ Intubated	☐ BiPAP/CPAP/High flow	
Deceased (at time of reporting)?	☐ Yes	☐ No	

Clinical Specimens: ***Please contact valerie.howard@health.mo.gov or (573) 522-2824 to coordinate clinical samples to the MO State Public Health Lab.***

Bronchoalveolar lavage performed?	☐ Yes	☐ No	Date of BAL, if known: _____
Lung biopsy performed?	☐ Yes	☐ No	Date of biopsy, if known: _____
Blood sample available for testing?	☐ Yes	☐ No	Date of sample, if known: _____
Urine sample available for testing?	☐ Yes	☐ No	Date of sample, if known: _____

Clinical Impression

In your medical opinion, is the patient's current illness due to vaping? ☐ Yes ☐ No
Were cardiac, neoplastic, and rheumatologic etiologies ruled out? ☐ Yes ☐ No

Final/Working Diagnosis: _____

Please attach a copy of the admission history and physical, discharge summary, if available and patient survey.

Lung Injury Associated with E-Cigarette Use or Vaping

Background Information

Any information you provide on this form may help us identify what is making people sick. If you would like help filling out this form, please ask a staff member. Thank you!

Name_____ **Date of birth**____/____/____

Race: ☐ White ☐ Black ☐ Other_____ **Ethnicity**: ☐Hispanic ☐ Non-Hispanic

In the past 3 months, have you smoked any cigarettes (not in an e-cig?) Yes ☐ No ☐

In the past 3 months, have you smoked any marijuana (eg. joints/bong)? Yes ☐ No ☐

In the past 3 months, have you…

… vaped/Juuled any substances that contain nicotine? Yes ☐ No ☐

… vaped/dabbed any substances that contain THC? Yes ☐ No ☐

… used any Dank Vapes substances? Yes ☐ No ☐

Did you share any vaping products with someone who also got sick? Yes ☐ No ☐

When did you first start vaping or dabbing THC substances? Yes ☐ No ☐

_____

Are you aware of the current outbreak of lung illness related to vaping? Yes ☐ No ☐

If yes, did you change how you use e-cigarettes/vaping products or devices? Yes ☐ No ☐

If yes, how? _____

Vaping Substance Use Information

Please tell us about each substance you have vaped/Juuled/dabbed in the past 3 months:

	Please provide details about each substance	In what form did you use this substance?	How many times a day did you use this substance?	Where did you usually get this substance?	What kind of device did you usually use with this substance?
Product 1	Contains THC ☐ CBD ☐ Nicotine ☐ Other ☐ (Specify_____) Brand name: Date first used: Date last used:	☐ Pre-filled cartridge/pod ☐ Liquid/oil not in pre-filled cart ☐ Solid/wax ☐ Leaf/flower ☐ Other _____ **Can public health get this substance for testing?** Yes ☐ No ☐	☐ <1 x per day ☐ 1-2 x per day ☐ 3-5 x per day ☐ >5 x per day ☐ Not sure If >5x per day, how many times per day? ____	☐ Family or Friend ☐ Street ☐ Grocery, Drug or Convenience store ☐ Vape or Smoke shop ☐ Dealer ☐ School ☐ Online ☐ Dispensary (other state) ☐ Other (please specify)	☐ Disposable e-cig or vaping device ☐ E-cig for prefilled or refillable cartridges/pods ☐ E-cig with a tank that you refill with liquid ☐ Dab rig / Dab pen ☐ Vaporizer (for dry herbs, etc.) ☐ Mod device (e.g. with modifiable settings/voltage) ☐ Other (please specify)
Product 2	Contains THC ☐ CBD ☐ Nicotine ☐ Other ☐ (Specify_____) Brand name: Date first used: Date last used:	☐ Pre-filled cartridge/pod ☐ Liquid/oil not in pre-filled cart ☐ Solid/wax ☐ Leaf/flower ☐ Other _____ **Can public health get this for testing?** Yes ☐ No ☐	☐ <1 x per day ☐ 1-2 x per day ☐ 3-5 x per day ☐ >5 x per day ☐ Not sure If >5x per day, how many times per day? ____	☐ Family or Friend ☐ Street ☐ Grocery, Drug or Convenience store ☐ Vape or Smoke shop ☐ Dealer ☐ School ☐ Online ☐ Dispensary (other state) ☐ Other (please specify)	☐ Disposable e-cig or vaping device ☐ E-cig for prefilled or refillable cartridges/pods ☐ E-cig with a tank that you refill with liquid ☐ Dab rig / Dab pen ☐ Vaporizer (for dry herbs, etc.) ☐ Mod device (e.g. with modifiable settings/voltage) ☐ Other (please specify)

If you used more than two substances, please list them on the next page

Additional Information

Can the Missouri Department of Health and Senior Services contact you for more information? Yes ☐ No ☐

Can the FDA contact you for more information? Yes ☐ No ☐

Contact information: **Phone number:** _____ **Email address:** _____

When you have completed this survey, please give it back to your healthcare provider.

Lung Injury Associated with E-Cigarette Use or Vaping

Additional Substances (if you used more than two substances)

	Please provide some details about each substance	In what form did you use this substance?	How many times a day did you use this substance?	Where did you usually get this ? substance	What kind of device did you usually use with this substance?
Product 3	Contains THC ☐ CBD ☐ Nicotine ☐ Other ☐ (Specify_____) Brand name: _____ Date first used: _____ Date last used: _____	☐ Pre-filled cartridge/pod ☐ Liquid/oil not in pre-filled cart ☐ Solid/wax ☐ Leaf/flower ☐ Other _____ **Can public health get this for testing?** Yes ☐ No ☐	☐ <1 x per day ☐ 1-2 x per day ☐ 3-5 x per day ☐ >5 x per day ☐ Not sure If >5x per day, how many times per day?	☐ Family or Friend ☐ Street ☐ Grocery, Drug or Convenience store ☐ Vape or Smoke shop ☐ Dealer ☐ School ☐ Online ☐ Dispensary (other state) ☐ Other (please specify)	☐ Disposable e-cig or vaping device ☐ E-cig for prefilled or refillable cartridges/pods ☐ E-cig with a tank that you refill with liquid ☐ Dab rig / Dab pen ☐ Vaporizer (for dry herbs, etc.) ☐ Mod device (e.g. with modifiable settings/voltage) ☐ Other (please specify)
Product 4	Contains THC ☐ CBD ☐ Nicotine ☐ Other ☐ (Specify_____) Brand name: _____ Date first used: _____ Date last used: _____	☐ Pre-filled cartridge/pod ☐ Liquid/oil not in pre-filled cart ☐ Solid/wax ☐ Leaf/flower ☐ Other _____ **Can public health get this for testing?** Yes ☐ No ☐	☐ <1 x per day ☐ 1-2 x per day ☐ 3-5 x per day ☐ >5 x per day ☐ Not sure If >5x per day, how many times per day?	☐ Family or Friend ☐ Street ☐ Grocery, Drug or Convenience store ☐ Vape or Smoke shop ☐ Dealer ☐ School ☐ Online ☐ Dispensary (other state) ☐ Other (please specify)	☐ Disposable e-cig or vaping device ☐ E-cig for prefilled or refillable cartridges/pods ☐ E-cig with a tank that you refill with liquid ☐ Dab rig / Dab pen ☐ Vaporizer (for dry herbs, etc.) ☐ Mod device (e.g. with modifiable settings/voltage) ☐ Other (please specify)
Product 5	Contains THC ☐ CBD ☐ Nicotine ☐ Other ☐ (Specify_____) Brand name: _____ Date first used: _____ Date last used: _____	☐ Pre-filled cartridge/pod ☐ Liquid/oil not in pre-filled cart ☐ Solid/wax ☐ Leaf/flower ☐ Other _____ **Can public health get this for testing?** Yes ☐ No ☐	☐ <1 x per day ☐ 1-2 x per day ☐ 3-5 x per day ☐ >5 x per day ☐ Not sure If >5x per day, how many times per day?	☐ Family or Friend ☐ Street ☐ Grocery, Drug or Convenience store ☐ Vape or Smoke shop ☐ Dealer ☐ School ☐ Online ☐ Dispensary (other state) ☐ Other (please specify)	☐ Disposable e-cig or vaping device ☐ E-cig for prefilled or refillable cartridges d/pods ☐ E-cig with a tank that you refill with liquid ☐ Dab rig / Dab pen ☐ Vaporizer (for dry herbs, etc.) ☐ Mod device (e.g. with modifiable settings/voltage) ☐ Other (please specify)
Product 6	Contains THC ☐ CBD ☐ Nicotine ☐ Other ☐ (Specify_____) Brand name: _____ Date first used: _____ Date last used: _____	☐ Pre-filled cartridge/pod ☐ Liquid/oil not in pre-filled cart ☐ Solid/wax ☐ Leaf/flower ☐ Other _____ **Can public health get this for testing?** Yes ☐ No ☐	☐ <1 x per day ☐ 1-2 x per day ☐ 3-5 x per day ☐ >5 x per day ☐ Not sure If >5x per day, how many times per day?	☐ Family or Friend ☐ Street ☐ Grocery, Drug or Convenience store ☐ Vape or Smoke shop ☐ Dealer ☐ School ☐ Online ☐ Dispensary (other state) ☐ Other (please specify)	☐ Disposable e-cig ☐ E-cig for prefilled or refillable cartridges/pods ☐ E-cig with a tank that you refill with liquid ☐ Dab rig / Dab pen ☐ Vaporizer (for dry herbs, etc.) ☐ Mod device (e.g. with modifiable settings/voltage) ☐ Other (please specify)
Product 7	Contains THC ☐ CBD ☐ Nicotine ☐ Other ☐ (Specify_____) Brand name: _____ Date first used: _____ Date last used: _____	☐ Pre-filled cartridge/pod ☐ Liquid/oil not in pre-filled cart ☐ Solid/wax ☐ Leaf/flower ☐ Other _____ **Can public health get this for testing?** Yes ☐ No ☐	☐ <1 x per day ☐ 1-2 x per day ☐ 3-5 x per day ☐ >5 x per day ☐ Not sure If >5x per day, how many times per day?	☐ Family or Friend ☐ Street ☐ Grocery, Drug or Convenience store ☐ Vape or Smoke shop ☐ Dealer ☐ School ☐ Online ☐ Dispensary (other state) ☐ Other (please specify)	☐ Disposable e-cig or vaping device ☐ E-cig for prefilled or refillable cartridges/pods ☐ E-cig with a tank that you refill with liquid ☐ Dab rig / Dab pen ☐ Vaporizer (for dry herbs, etc.) ☐ Mod device (e.g. with modifiable settings/voltage) ☐ Other (please specify)

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